



NORTH SHORE RAILWAY.

VIEWS OF THE CHIEF ENGINEER AS TO THE TRUE CONSTRUCTION OF THE CONTRACT, WITH REFERENCE TO CHANGING THE LINE &c., DURING THE CONSTRUCTION OF THE ROAD.

OFFICE OF THE ENGINEER IN CHIEF,

QUEBEC, JANUARY 30th, 1875.

MR. PRESIDENT :

Referring to the existing differences between the Provincial Government, the Railway Company, and the Contractor, in connection with all of which, the Chief Engineer seems, by common consent, to have been chosen Defendent or Respondent. And having placed in your hands, a "Review" of the objections raised by the Government to the character of the work; also full replies to all the charges and allegations made by the Contractor, with reference to my administration of the Engineer Department; and the whole case

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VIEWS OF THE CHIEF ENGINEER

having very properly been placed, by the Railway Company, in the hands of Mr. Sandford Fleming, a Civil Engineer of deservedly high standing in his profession, for the purpose of obtaining his counsel and advice, as a guide in any future action which it may be necessary to take in the matter; I desire, at the present time, to place on record some views of my own, with reference to a question which was, for the first time, raised by the Contractor, in his communications to the Company, dated January 11th and 13th, 1875; and subsequently raised by him in some questions which he submitted to Mr. Fleming on the 27th inst.

I refer particularly to the power of the Chief Engineer, under the contract, and subject to the approval of the Board of Directors, to revise the line, and grades of the road; together with the plans of structures; and also the "Schedule" upon which the monthly or progress estimates are to be based, *at any and all times*, during the construction of the road.

The following is a quotation from the Contractor's letter of the 11th inst. :

"Last summer's work of the Engineers on the Montreal Division is useless, as the profiles on that part of the line were made previous to my assuming the contract, and formed part thereof. No change in that location *without my approval and consent*, can take place."

The following is an extract from my reply to the above letter, under date of Jan. 13th 1875 :

"The re-location of the Montreal Division, during last summer, was necessary; and was approved of by the Contractor, for the purpose of improving the line, reducing the cost of the work, and enabling us to perfect the

land plans, preparatory to procuring the right of way. The work done by the locating parties during the past season, has resulted in a material improvement in the line; and also in a saving to the Contractor in the cost of construction, amounting to several thousand dollars over and above the cost of the surveys."

In my reply of the 22nd inst., to the Contractors subsequent letter to the Company, under date of Jany. 13th, 1875, the following remark is made upon this subject:—

"I have now reached a point in the Contractors statement, which, in my opinion, is of far more importance to the Company, than any other which is contained in his letter. This point is embodied in the language which immediately follows the above quotation, to wit:

"What was proper then in the height and width of embankments, cannot be different now; and no change from these profiles which form part of my contract with you, *can be changed without my consent.*" Inasmuch as the position assumed by the Contractor, in the above extract, has no direct bearing upon the questions now at issue between the Contractor and the Chief Engineer; and inasmuch as the *vital principles* of the contract are involved in the question, I beg leave to reserve what I may think proper to say upon that subject, until another and more fitting occasion."

An occasion of this kind presented itself, on the evening of the 27th inst., when Mr. Fleming, in the presence of the President, several of the Directors, and the Contractor, requested me to furnish him in writing, on the following morning, with any remarks which I might think proper to make respecting the questions then submitted for his consideration by the Contractor,

in addition to those which had previously been submitted to him by the Board of Directors.

A very hastily prepared paper was therefore placed in Mr. Fleming's hands, on the morning of the 28th inst. the following extract from which, refers directly to this subject.

"The Chief Engineer admits that he has always, and voluntarily furnished the Contractor's office with copies of maps, profiles, plans, &c. connected with the line, during their different stages of advancement towards perfection; but he does not admit that this has been done for the *guidance* of the Contractor, to such an extent, that they could not be changed or improved thereafter, if deemed advisable, either before the Contractor had entered upon the work, or had made such provision for its execution as would involve no extra trouble and expense.

"The Chief Engineer is not aware however, that any such change has been objected to by the Contractor up to this date; and also claims that such changes have resulted very largely to the benefit of the Contractor,

"Referring more particularly to the "Schedule" spoken of in the Contractor's question, the Chief Engineer refers to the provisions of the contract, as to his power to revise and correct it from time to time, during the progress of the work.

"He also refers to the fact, that the last revision of the "Schedule" was made with the Contractor's knowledge and consent; and that he has continued to receive his progress estimates under it, without protest or complaint.

"Appended hereto will be found a letter addressed by the Chief Engineer to the Contractor on the 10th

October 1874, together with a list of prices furnished by him in reply thereto.

"The Chief Engineer further submits, that an examination of the Supplemental Contract will show, that the present Contractor assumed the precise position of the original Contractors, with a full knowledge of every expenditure that had been made upon the road, previous to the date of this assumption."

Fearing that any attempt upon my part to argue this point farther at that time, might be misconstrued, I will now enter more fully upon the subject which, as before stated, I consider of far more importance to the Railway Company, than any other which is now before the Board of Directors.

Referring directly to the contract, it will be found, "that the aggregate length of the main Line and Piles Branch shall not exceed one hundred and ninety miles;" and also "that the most direct and practicable route of which the capabilities of the country will reasonably admit shall be adopted, both for the Main Line and Branch."

Referring also to the first clause of the Specifications for the Main Line, it will be found that the "*Initial*" and "*Terminal*" points only in the line are *fixed*; and that "the location of the line, and the arrangement of grades between the *Initial* and *Terminal* points, will be made under the direction and supervision of the Engineer in Chief, and subject to the approval of the Board of Directors of said Company."

The foregoing being the only clauses in the contract which bear upon the location of the line; and there being no time limited during which the location shall be perfected, it has been assumed that the ordinary practice in such cases, would be adhered to upon this road.

In my "Report on Location and Construction," dated 10th October, 1872, I proceed to give 1st. "General description of the route;" and state that: "The accompanying Map, showing the general location and profile of the North Shore Railway, drawn to a scale of $2\frac{1}{2}$ miles to an inch, will serve to *illustrate* the foregoing general description of the route. And the accompanying location plans and profiles of the different sub-divisions of the line, will serve to *illustrate* the details of location, so far as relates to alinement, gradients, and the *general character of the work.*"

Referring in a subsequent part of the same Report, to "the foregoing general description of the route," I state that: "I can therefore certify unhesitatingly, to the Board of Directors, that the line now recommended for approval, is, in the language of the contract, the most direct and practicable *route* of which the capabilities of the country will reasonably admit."

After thus committing myself to the "general route" of the location recommended in that Report, I should not have felt authorized, subsequently, to make any material departure from this general route, without the approval of the Board of Directors; but, I hold, that the provisions of the contract justify; and that common custom, upon every road that has been constructed, allows the Chief Engineer to make any improvements in the *details*, both of the location of the line, and the arrangement of the grades, within the limits designated for the *general route*, that in his opinion the permanency and success of the work may render expedient; and that he may unquestionably do this, at any and all times; either before the Contractor has entered upon the work; or before he has made such provision for its execution

as may involve extra trouble and expense, as stated in my remarks to Mr. Fleming.

I will even go a step further, and claim with entire confidence, that if, after the Contractor has entered upon and partially completed any portion of his work, the Chief Engineer becomes satisfied, either that the line or gradients, are not in the right position; or that his plans are in any respect defective or imperfect, he not only *has the right under the contract*; but it is his *imperative duty* to make such changes, as in his opinion, the good of the work may require.

Not only the universal custom, upon other similar works, is relied upon, to sustain this theory; but the following clauses from the specifications are referred to, as bearing directly upon this branch of the subject:

"2. The term *Engineer*, when used, either in the contract or specifications, will in all cases refer to the Engineer in Chief of the North Shore Railway, or to any subordinate Engineer, who, acting under instructions from the Engineer in Chief, may for the time being, have the direct charge and supervision of the work particularly referred to.

"3. The work will, in all cases, be under the direct charge and control of the Engineer; and his orders must be complied with in every respect, and under all circumstances. He will have power, and it will be his duty to reject or condemn, at any stage or condition of the work, all workmanship or material, which, in his opinion, may be imperfect or unsuitable; and the same must be immediately corrected, or replaced, to his entire satisfaction."

I admit however, that in doing this, he should, in justice to the Contractor, indemnify him for any loss in work, materials or expenditure that he may have incurred, *under the direction of the Engineer*, by reason of such change; which indemnity may readily be made by reducing the required expenditure upon other and less important items embraced in the contract.

To insist that in 1872, it was possible for the Chief Engineer, with such engineering talent as he then might

happen to find available for the purpose, to locate the entire line from Quebec to Montreal so perfectly, that, two years afterwards, when every bench-mark, tangent-point, and center-stake had either been removed or destroyed, an entirely new Staff of Engineers, could even find the original line and stake-holes, seems of itself, to be quite unreasonable.

But when it is claimed, that in addition to this, he is forever afterwards precluded from making any improvements in this line; or in the plans of structures which he then may have deemed proper to anticipate; or in the hastily prepared quantities which he then may have computed, the idea, to my mind at least, seems to be perfectly preposterous

In order to demonstrate :

1st. That the views above expressed were entertained by me, at the date of the original contract; and while the work was in the hands of the Chicago Contracting Company.

2d. That they were fully concurred in and acted upon by that Company; and

3d. That the present Contractor has fully concurred in, and is now acting upon them :

I will state, that at the request of the Chicago Contracting Company, in 1872, I prepared a form of sub-contract to be used by them, and which they afterwards printed, in which was embodied the following clause: "First—The party of the second part hereby agrees to procure and furnish the lands for right of way, together with all necessary extra widths for borrowing pits, and waste or spoil banks, without unnecessary delay, said second party reserving the right *at any time, to change the location of the line, and the establishment of the grades* ;

and it is mutually agreed that *no extra charge* will be claimed or allowed on account of *such changes in the line or grades*, the prices herein mentioned being considered as *full compensation* for the various kinds of work agreed to be performed."

The printed form from which the foregoing is an extract, was used by the Chicago Contracting Company, in their sub-contract with Mr. Hulburt, for the portion of the work near Quebec; and the same form, *with this clause unchanged*, has been used by the present Contractor in all his sub-contracts where the form could be made available.

If further evidence is wanted, I have but to refer to the Contractor's letters to the Railway Company; the proceedings of the Board of Directors; and the Reports of the Chief Engineer, during the past year, in connection with the location of the line within and near the city of Quebec, in order to prove that the views, not only of the Contractor, but of the Railway Company, have heretofore been in full accord with the views of the Chief Engineer.

If the Contractor has heretofore entertained his present views, why has he not, during the past Fall, laid the track through King street, as described in my Report on location in October 10th, 1872; and thence onward through St. Sauveur, where the work was actually commenced in 1872; and thus have given the Company an earnest, not only of his present sincerity; but of his intention to carry out his contract; instead of waiting and complaining that the Chief Engineer and the Company are keeping back his work, by their delay in deciding upon the location of the line within and near the City.

It was in accordance with the principle, herein defended, and which, in my opinion pervades the entire contract, that I changed the location of the line and grades and increased the cost of construction between the Maskinonge and Chicot Rivers in 1873, while the work was in the hands of the Chicago Contracting Company.

It has also been the governing principle in any changes that have been made during the past year, since the work has been in the hands of the present Contractor, which changes have, thus far, resulted greatly to his advantage.

It was also in accordance with this principle that "Circular No. 2" dated June 12th, 1874, was prepared "For the information and guidance of the Engineer Department and Contractor, with reference to certain matters which are left open for the decision of the Engineer, in the General Specifications for the Main Line" from which the following are extracts:

"The contract for the construction and equipment of the North Shore Railway, and the general specifications attached thereto, provide for a *first-class railway* in all respects, so far as the main line between Quebec and Montreal is concerned.

"The fact that this was made a condition precedent, which must be complied with before either the Railway Company, or the Contractor, would be entitled to receive the large amount of aid granted to the road by the Provincial Government, and the City of Quebec, rendered it unnecessary to embody in the original specifications, all the details which are usually contained in the specifications for a first-class railway, and many matters of importance were therefore left to the decision of the Engineer, during the progress of the work.

"In view of the great importance of insuring a perfect understanding, and harmony of action, at the out-set, as well as uniformity in the character of work upon all portions of the line; and also for the purpose of facilitating the proper execution of the work, and of carrying out the true spirit and meaning of the contract and original specifications, the following *explanatory or detailed* specifications have been prepared in relation to the different classes of work hereinafter referred to, so far as any contingency connected therewith can now be foreseen and provided for."

"The character of the fencing and gates along the boundary lines of the Railway, as regards the durability of the materials of which they are composed, and the style and workmanship of their construction, must be fully up to the standard of the fencing and gates in general use upon the first-class farms contiguous to the Railway in the Parishes and Counties through which the Railway passes."

"The minimum width of *twelve feet* as specified for single track, is intended to apply only to cases, both in excavations and embankments, where the native material is of sand or gravel, suitable for the reception of the superstructure without requiring ballast; but when such is not the case, the road bed will be left with a top width of fifteen feet at sub-grade, so as to allow of one foot in depth of ballast, and a finishing width of twelve feet at grade."

"The finishing width of twelve feet, as above specified, is intended to apply to the road bed after becoming fully settled, and after the slopes have become firmly fixed in position, so as to be free from the dangers of scouring, slides, &c.; and the Engineer in charge must make due allowance, in extra widths, for height of banks, character of material, and other contingencies of this nature, during the progress of the work."

"The Engineer in direct charge of the work will bear constantly in mind the paramount necessity in this climate, of guarding against the dangers of obstructions from snow, in the future running of the road; and he will be expected to adopt every practicable expedient to obviate this danger, both in the formation of earth works, and in the borrowing and disposition of material; having in view also the future construction of snow fences along the line, at all exposed points."

"The question of cross or lateral drainage will be made the subject of special observation and study by the Engineer in direct charge of the work; and great care must be taken to adopt openings of sufficient sectional area to pass the waters of the highest floods ever known, likely or to occur in the locality. In cases of doubt, the decision should always be upon the side of safety."

"The term *First-class rubble masonry*, as used in paragraph 2, under the head of MASONRY, in the General Specifications, is intended, so far as regards strength, durability, general appearance, and proper adaptation to secure work which shall be fully up to the standard for similar structures upon the Intercolonial, Grand Trunk, Great Western or any other first-class Railway in Canada.

The exception with reference to broken or irregular courses, in extreme cases where the quarry will not afford stone of uniform thickness for every course, must not be construed in such a manner as to result in work which shall be inferior in strength and durability, to ordinary first class ranged work.

The following extract from the *Specifications for the Intercolonial Railway* is given as a guide to the Engineer in charge, Contractors and Inspectors, with reference to the general character and details of this class of work in the more important structures upon this road:—

“Should contingencies occur during the progress of the work, which have not been referred to, or provided for, in the above, they will be immediately reported to the office of the Engineer-in-Chief for further information and instructions.”

The same principle was also strictly adhered to, in the preparation of the “Detailed Specifications for foundations in deep water:” from which the following are extracts:

GENERAL DESCRIPTION.

“In cases where solid Rock is not easily attainable, it is proposed to furnish substantial and durable foundations for bridge masonry in deep water, by means of a *composite sub-structure*, to be formed of piles, surrounded by a rough, strong crib work, filled with stone.

It is intended that the entire weight of the masonry, and bridge superstructure shall be supported by the bearing piles; and that the crib shall keep the piles firmly in position; and at the same time, protect them from the effect of scouring or undermining, by reason of the action of the current upon the bed of the stream.

The following method of construction will be adopted, subject to such modifications as may, from time to time, be directed or approved by the Engineer, during the progress of the work.”

FURTHER PROTECTION.

“After the platform has been securely anchored in its place upon the piles, such further protection, or guard piles, shall be driven; and such additional connections, fastenings and finish shall be put upon the top, and outer side of the crib work, including brush and rip-rap around the bottom, as may be required by the Engineer, for the purpose of protecting it thoroughly from the injurious action of the water, ice, or any other danger to which the foundation may become exposed.”

Believing, as I do, that the foregoing quotations are in full accord with the spirit of the contract; and that they are therefore as binding upon both parties to the contract, as the General Specifications attached thereto, the same principle, if properly applied may, in my opinion, also be made to remedy the most, if not all of the objections, which have recently been raised by

the Provincial Government, either as to the height and width of earth-works; or to the plans for mechanical structures upon the line, in case it should be found necessary or expedient to do so, for the purpose of securing the promised aid from the Government for the construction of the Road.

Believing, however, as I sincerely do, that this important enterprise is now passing through an ordeal upon the result of which will depend, either its speedy completion, upon the basis of the present contract, plans and profiles; or its speedy death and burial, beyond the hope of any immediate resurrection, I have to the best of my ability, and in good faith to the Railway Company and the Contractor, endeavored, up to the present time, to combat this idea; and to show that the true policy of all parties interested, is to complete the road, as soon and as perfectly as possible, upon the location, gradients and plans heretofore approved by the Government, through its Directors; and also by the Railway Company, and the present Contractor.

With reference to the "Schedule," upon the *infallibility* of which the Contractor seems to have placed so much reliance, I have only to remark, in addition to what is contained in the "Remarks" submitted to Mr. Fleeming, that, if the foregoing theory, as to the power of the Chief Engineer to change the line, gradients, plans of structures, &c., is admitted, it must also be admitted that he has the same power to change his "Schedule" of quantities, at any and all times, when the changes in the line, gradients, plans, &c., may, in his opinion render it necessary, in order that it may represent, as nearly as possible, what it was evidently intended to represent by the provisions of the contract.

In pursuance of this idea, the following form of certificate has been attached to every "Schedule" that has been prepared in this office :

"I hereby certify that the above is a correct schedule of the cash and relative contract values of the different classes and items of expenditure required to construct and equip the Main Line of the North Shore Railway under the contracts dated (&c. &c.,) so far as the same can be ascertained from *existing data*. The same being subject to *future revision and correction*."

The facts, that the Railway Company has to obtain the approval, by the Dominion Government, of the location and plans of the most important and expensive structures upon the Road ; and that this approval has not in all cases yet been obtained, are of themselves sufficient evidence of the entire impracticability of either preparing a perfect "Schedule" ; or of fixing the precise location of the line, even at the present time.

I beg leave to submit further, in connection with this whole subject, that there are no profiles, either referred to in, or attached to the original or supplemental contracts, and *forming part thereof*, as claimed by the Contractor.

The only profiles ever referred to, in this connection, were mentioned, as having been examined by the original Contractors, in their first proposition for constructing the road, which proposition, as subsequently modified, forms the basis of the present contract.

These were the *old profiles* of the line, as run twenty years ago ; and the quantities based upon them, which were also shown to the original Contractors, exceeded very largely the quantities based upon the present profiles ; although I am very sorry to say, the grade line

in many places, and over large distances, was laid quite as near the natural surface of the ground, as it is upon the present profiles.

I have carefully preserved these profiles, in case they should be wanted for future reference.

I also beg leave to submit, that the voluntary and unsolicited assumption of the original contract, by the present Contractor, involved merely a change in the name of the "party on the first part," so far as the Railway Company and their Chief Engineer were concerned; and that it did not involve a change in the legal *status* of the parties, as claimed by the Contractor.

Therefore, whatever information the present Contractor may have afterwards found in the office of the original Contractors, could have possessed no greater significance or value to him, than it had previously possessed to the original Contractors.

Furthermore, I have occasion to know, that the present Contractor considered everything which he happened to find in the Contractor's office, after his assumption of the contract, of so little importance and value to himself, that he even allowed the original Contractors to take with them, out of the country, all of the accounts and vouchers for the expenditures which they had previously made on account of the contract.

In view of the great importance to the Railway Company, of the questions herein discussed; as well as others which are now pending with the Government and the Contractor, I would respectfully, but earnestly recommend that the Company take the measures necessary to ascertain its legal position and rights under the contract, at the earliest possible day.

I have only to add, in conclusion, that when it is

considered that the Contractor, who has undertaken to execute the contract, understands its most important provisions in a manner so diametrically opposite to the understanding of the Chief Engineer, who prepared the contract and specifications ; and whose duty it is to see that they are properly executed, it is not at all strange that frequent and serious collisions should have occurred between these parties, during the progress of the work. In fact, I think it may be regarded as almost wonderful that, under such a state of things, any material progress has hitherto been made in the work.

If the present discussion of these subjects, and their reference to an enlightened and disinterested Engineer, shall bring about a union of sentiment and purpose that shall result in a united effort to secure the speedy and proper completion of the Road, the sincere friends of the enterprise will certainly have no cause to regret that the discussion has taken place ; unless it shall unfortunately be found to have *blasted* the enterprise, in the eyes of capitalists, to such an extent, that they will refuse to invest their money in the securities of the Company ; and thus secure the final abandonment of the road, to the fullest extent that has heretofore been predicted by its most open and violent enemies.

Respectfully submitted,

SILAS SEYMOUR,
Engineer in Chief.

TO THE PRESIDENT AND DIRECTORS.